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ABSTRACT

Procedures used to select classes for an intensive study of change processes in teacher and student classroom behavior resulting in increases in academic learning time are discussed. Included in the text are sections on the philosophy of the intervention, the procedures and methodology to be used, the history of selection, the instructional model, and examples of possible interventions in classes selected for inclusion in the study. A final section, titled Summary Comments, contains the three major recommendations of the Commission's Research Advisory Board, which reviewed this document. (Authors/MJB)

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Technical Note IV-1

DESCRIPTION OF CLASSES AND PLAN FOR AN INTERVENTION STUDY

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PREFACE

This document is submitted to the California Commission for Teacher Preparation and Licensing to describe the procedures used to select classes for an intensive study. The classes are specially chosen to be test sites for an intervention that will lead to student and teacher changes in classroom behavior. The intervention is based upon a model of classroom teaching and learning described in this paper. The intervention is expected to take place from January to May, 1977.

This technical note contains sections on the philosophy of the intervention, the procedures and methodology to be used, the history of selection, the instructional model, and examples of possible interventions in classes that we have chosen to work in. A final section, titled Summary Comments, contains the three major recommendations of the Commission's Research Advisory Board who reviewed this document.

This paper was written in December, 1976. The comments in the last section were added shortly thereafter.

PHILOSOPHY

The Proposal for Phase III-B of the Beginning Teacher Evaluation Study calls for an intervention to increase Academic Learning Time (ALT) for target students by working with teachers to change critical instructional variables. The Proposal says:

A small intervention in natural classroom instruction will be conducted during the B-C test interval. Instructional process data will be used to select 12 classes from the second grade sample. Classes will be selected so that the manipulation of one or more teacher behaviors is likely to have a substantial impact on student ALT. These twelve classes will be assigned randomly to one of three groups.

Group I. One group of four classes will operate as a control group. In the control group the already established pattern of testing, observation, and log keeping will continue.

Group II. A second group of four classes will comprise the full intervention group. In each class, the instructional processes that are judged to have greatest potential for increasing ALT in that particular class will be manipulated during the B-C test interval. The intervention will be carried out by a team of BTES researchers. Early in the B-C interval BTES staff will clinically train teachers in specific behaviors designed to improve the diagnosis, prescription, presentation, monitoring, and/or feedback received by the target students. The impact of the intervention will be monitored by the ongoing observations carried out in all classrooms. The BTES staff will document their clinical teacher training procedures in each

of the classrooms and continue the intervention until student ALT is increased substantially. The documentation of the techniques that were used to increase ALT will provide information for Phase IV of the BTES.

Group III. A third group of four classes will comprise a restricted intervention treatment. In this condition, verbal instructions on how to modify ALT and a rationale for the intervention are given to teachers. No further activities will be included in their treatment beyond the ongoing collection of data. In this treatment, we can examine a teacher's changes in behavior as a function of feedback on their teaching performance and a theory of instruction that can guide that instruction.

Philosophy Updated and Elaborated

Only minor changes in the philosophy of intervention have occurred since the writing of the proposal for the study, submitted in May, 1976. At that time it was stated that the intervention was to obtain first-hand, "hands-on" information about how different teacher behaviors affect the ALT of students. The thinking was that in the major correlational study, naturally occurring teacher behaviors and associated rates of ALT were being measured. On the other hand, an intervention would serve to heighten teacher behaviors, and thus, theoretically, heighten ALT. In addition, if higher levels of ALT occur it should be possible to detect higher levels of achievement in particular content areas.

The intervention has always been conceived of as a chance to obtain a great deal of clinical information about what works and what does not work, such that the ultimate consumers of the BTES

research will have some guidelines when they try to implement some of our findings. We think that the clinical studies of how particular teacher behaviors affect ALT in positive (or even negative) ways, will yield information about how to translate the findings of BTES into training practices. This information should be very useful to those who train teachers.

After many meetings, it was decided by the BTES staff that no standardized techniques would be imposed across all four full intervention classrooms. Each of the classrooms is expected to be unique; thus the imposition of standardized techniques across classrooms would seem to defeat the spirit of the intervention. Each classroom will be treated as a unique ecological setting.

We have assigned one intervention field worker to monitor two classrooms. Two such field workers will be responsible for a total of four classes. Each of these field workers has elementary school teaching experience. Teamed with each of these intervention field workers, for each classroom, will be one of our senior staff. In each classroom the senior staff member and the "interventionist" (i.e., the field worker assigned to that class) will, with the teacher, decide upon changes in instruction carried out in that particular classroom.

We have come more and more to appreciate the value of making the teacher a full partner, a colleague, in the intervention team. We do not think we are wise enough to tell teachers what to do, nor do we believe that would be an effective way to bring about change. Rather, we hope to create a situation in which each of us can learn more about classroom instruction. The senior staff member will discuss with the teacher and the interventionist the BTES model and

the insights it offers into the patterns of classroom instruction. Specific characteristics of the classroom will be discussed as they relate to the model. The teacher will be encouraged to discuss his or her perceptions of the classroom and to help us understand classroom realities. To encourage greater participation by the teacher, we have offered the teachers released time to observe their own classes. A group meeting will be held to allow the four teachers to share their experiences with each other. We hope to do everything possible to make this a collegial effort.

Because of the importance of teacher involvement and collegial effort, we have decided against random assignment of teachers to intervention groups. In classes where intervention appears possible and desirable, teachers will be invited to participate. Only those teachers who are interested and willing will be included in the full or restricted intervention groups. All others with comparable ALT, including extra volunteers, will constitute a control group.

We have decided that during the first six weeks of the intervention, in each of the four classrooms, we will try to work within the BTES model of teaching presented below in this description of the intervention. During these early weeks the kinds of diagnosis and prescriptions we will make will be nested within the five functions we are studying. We believe that the teaching functions we have described as necessary for the conduct of classroom instruction provide a very good theoretical model within which to suggest changes in the behavior or classroom characteristics of the four volunteer teachers. Thus, the intervention, at least for the first six weeks, will have very close ties to the model of instruction proposed in the overall correlational study.

Because we are ourselves unsure and new at trying to modify teacher behavior and classroom practices according to our model, we also believe it may be a mistake to try to restrict ourselves to working within the model. If, after the first six weeks, we do not see changes in teachers' behavior and do not see actual changes or the potential for changes in the students' behavior, we will start using any and all procedures which might help change what's going on in those classrooms. We may wish to focus on classroom management or affective conditions that seem to inhibit classroom learning. We may wish to apply behavior modification principles (perhaps in consultation with experts such as Thoreson, Krumboltz, or their students). We may wish to use minicourses and protocol materials.

The general guidelines are to stay as closely linked to our theory as we can, at least at the start of the intervention, and to "throw in the kitchen sink" if necessary, after we have tried implementation of an intervention based upon our theories. It may also be possible that in one class we may have very positive effects early in the intervention, while in another class more drastic approaches to changing teacher and student behavior are necessary. The intervention is meant to be an opportunity to learn and to document that learning for future use. We do not consider it a liability that such diverse approaches will be in effect; rather, we consider it an asset because we think it will allow us to learn more about the classrooms within which we will be working.

PROCEDURES AND METHODOLOGY

Full Intervention

The intervention will run six weeks during which time the intervention will be guided by the Beginning Teacher Evaluation Study (BTES) model of instruction (presented below). After six weeks the potential for prescribing the intervention will be expanded to include virtually any socially acceptable activities. This latter period will run for nine weeks. The first period of the intervention will begin January 10, 1977 and end February 18, 1977. The second period of the intervention will begin February 21, 1977 and extend nine weeks up to the "C" Testing period in early May.

During this intervention period, the BTES staff member and/or the intervener will meet with the teacher at least twice a week. Discussions will focus, particularly in the early weeks, on the BTES model and on the specific ways in which the five functions are or can be implemented in the teacher's classroom. Existing training materials for teachers may be used, if they seem relevant to a specific teacher's needs and preferences. The exact nature of the intervention will differ from one class to the next.

As the staff member, intervener, and teacher agree on possible improvements in instruction, changes will be implemented. The teacher will be the one responsible for carrying out changes in instruction. The intervener will provide ongoing support for the teacher during the implementation process. In addition, the intervener will keep records on discussions, decisions, and actual classroom behavior.

The product of the intervention research will be case histories of four classrooms, and with those classrooms, case histories of up to twenty-four students. Four separate descriptive case histories will be written, each co-authored by the interveners, teachers, and senior staff members. The case histories will describe the classrooms, the teacher's methods for organizing instruction, and the teacher behavior and student behavior before the beginning of the intervention. The case histories will also document the roles of the teacher and the Laboratory staff, the changes made in the classroom as a function of their cooperative decisions, and estimates of effectiveness of those changes.

The case histories will also provide some "harder" supporting data about the classrooms, obtained through ongoing observations of instruction in those classrooms and supplemented by the records kept by the interveners. Weekly estimates of the ALT rates of target students are made as part of the ongoing observation. Also, teacher behaviors are observed as part of this system. The interveners, who are fully trained in the observation system, can supplement these weekly data. With the A-B period and early weeks of B-C as a baseline, we expect to see increases in level of ALT for target students. These increases should result from increases in engagement and/or from more appropriate difficulty level. In addition to this within-class analysis of trends, comparisons can be made with the other two groups. Almost all analyses that compare treatments and almost all within treatment group analyses will reply upon descriptive statistics and graphs. Only rarely would inferential statistics (probably non-parametric comparisons) be used.

The summary chapters of the case histories of intervention in these classes will contain lists of changes in teacher behavior that resulted in increases in ALT for target (and non-target) students in those classes. The summary chapters will all be in the form of recommendations to teacher trainers, either in-service or pre-service trainers.

Restricted Intervention

This group of four teachers will receive limited training in the model of classroom instruction which forms the rational base of the work carried out during Phase III-B. The purpose of this group is to assess the impact of discussion about the model on classroom behavior. The group receiving the full intervention will be engaged in an ongoing collegial relationship with the Far West Laboratory staff. Weekly discussions and feedback will serve to elaborate and reinforce the model in these classrooms. However, it may be that considerable change in ALT may result from (a) a desire for change and (b) an awareness of the concepts included in our model. The restricted intervention group is included to check on this possibility.

The general purpose of the Intervention will be discussed with the teachers during initial contacts with them. The activities associated with their participation will be clearly described. The following section presents an overview of the activities.

The four teachers in this group will be provided with materials describing the model and its implementation. It is important to note that the model is prescriptive in terms of the instructional functions which must be satisfied in the classroom, but it is not prescriptive in terms of how these functions are carried out. The

model can be applied to a relatively wide variety of classroom structures including whole group instruction, supervised seatwork, work stations, individualized programs, and others. These materials will contain applications of the model tc specific classroom instructional sequences typically found in the study sample. Teachers will be asked to read the materials over a three to four day period. Subsequently they will meet with the Far West Laboratory staff at the Laboratory for two full-day meetings. The first meeting will take place during the week of January 17th, the second during the week of February 21st.

The purpose of the meetings will be to review the model briefly and then to engage in detailed discussions of each teacher's reading or mathematics program and the implications of the model for those specific programs. Discussions will emphasize the impact of classroom settings on ALT and the importance of particular teacher functions in specific classroom settings. For example, alternate monitoring strategies during seatwork activities will be discussed with particular attention to the effect of each strategy on student ALT.

At the conclusion of the "training days" an example of a classroom situation will be provided to each teacher. These examples will have been prepared prior to the meeting day from observations of the teacher involved. The teachers will be asked to analyze the examples and relate potential "solutions" to the model by predicting the impact of each "solution" on the ALT of the student. Meetings of this kind will make teachers aware of the model and will have generated several applications of the model for each teachers specific program. Whether or not the teachers change their classroom behaviors will be assessed as part of the regular observation conducted in the grade 2 classes.

Control Group

The only classes excluded from the group data which will be used as a comparison group will be those classes originally excluded from the pool of second grade classes because of extremely high levels of Academic Learning Time (ALT). This should provide a pool of about fifteen classrooms. The pooled data from these classrooms will be used as a comparison to examine the effects of the full intervention and restricted intervention treatments.

HISTORY OF SELECTION

Classroom Selection Procedure for the Intervention Study

The procedure for selecting intervention classrooms began in early October, when BTES staff met to discuss how to begin Intervention. Five meetings were held. By November, the tallying of two consecutive weeks of observation data, for all 25 second-grade classrooms involved in the BTES study was complete. Specifically, each classroom's op scan sheets were used to tally, for each individual student, difficulty level of the material to be learned, total engaged time, total non-engaged time, total reading and math time (the combination of engaged and non-engaged time), and the percent of time engaged. Table 1 presents data from one class subsequently chosen for the study. Table 2 presents data from a class that was not chosen.

The following factors were used in the first round of selection of classes for the intervention.

1. Classrooms in which percent engaged time was low or inconsistent.
2. Classrooms where the distribution of difficulty level seemed to swing towards the extremes of easy or hard, or where there seemed to be inconsistencies in difficulty levels from week to week.
3. Comments from fieldworkers on an open-ended, anecdotal questionnaire, which asked for a brief description of classroom structure, teacher behavior, teacher's attitude towards the study and teacher's interaction with target students.

Using facts 1, 2, and 3, twelve perspective classrooms were chosen as possibilities for intervention. It was felt that additional

op scan data should be analyzed to verify the choices made. Thus one more week's op scan data was analyzed for this pool of twelve classes.

During the last two weeks of November all of the twelve classrooms were observed by at least two BTES staff members. The two implementors observed all twelve classrooms. Of the twelve, eight classrooms were described by two or more staff members as feasible intervention candidates (i.e., classrooms in which ALT could be increased, with simple intervention strategies; and the cooperation and interest of the teacher could be obtained).

The eight teachers were asked whether they would be interested in further input into the research, through involvement in specific case studies of their identified students. The teachers would serve as part of a teacher-implementor-BTES staff member team that would focus on methodology for increasing ALT for given students in their classes.

Of the eight teachers approached five agreed to participate with the full realization that participation entailed two observers in their classroom on a regular basis as well as weekly allocations of time for conferencing. Four classrooms were chosen from these five for intervention. The four classrooms for the Prose Only Group, and the four classrooms for the Control Group are to be selected from the remaining second grade classrooms (see methodology section).

Class ID# 08

TABLE 1
An example of a classroom that was chosen as a possible intervention candidate.

	Student ID#	E (Easy)	M (Middle)	H (Hard)	Total Engaged Minutes (EW+EO+EC+ ED)	Total Non-Engaged (NI+NW+ NO) Minutes	Total Read & Math Time (Engaged & Non-Engaged)	Percent Engaged Engaged Total Time
First Observation	0801	67.5	37	0	73.5	31	104.5	.7033
	0802	16	24	0	12	28	40	.3
	0803	41	62	0	86.5	36.5	123	.7032
	0804	75.5	34	0	94.5	30	124.5	.7590
	0805	34.5	57	0	90	26.5	116.5	.7726
	0806	74.5	37	0	91	45.5	136.5	.6666
Second Observation	0801	103.5	0	13	88.5	28	116.5	.7597
	0802	76.5	33	0	54	51.5	105.5	.5118
	0803	79.5	34	0	61	52.5	113.5	.5374
	0804	94	21.5	0	82	33.5	115.5	.7100
	0805	78	29	0	60.5	47	107.5	.5628
	0806	0	0	0	0	0	0	0

Class ID# 08 (Grade 2)

Table 1 Continued

	Student ID#	E	M	H	Total Engaged (EW+EO+EC+ ED)	Total Non-Engaged (NI+NW+ NO)	Total Read & Math Time (Engaged & Non-En Engaged)	Percent Engaged (Engaged Total Time)
Third Observation	0801	86	8	0	40	54	94	.4255
	0802	89	5	0	37	57	94	.3936
	0803	88	20	0	50	58	108	.4630
	0804	81	0	0	48	33	81	.5926
	0805	73	8	0	36	45	81	.4444
	0806	91	0	0	74	17	91	.8132

Class ID# 11 (Grade 2)

TABLE 2
An example of a classroom not chosen for the Intervention Study.

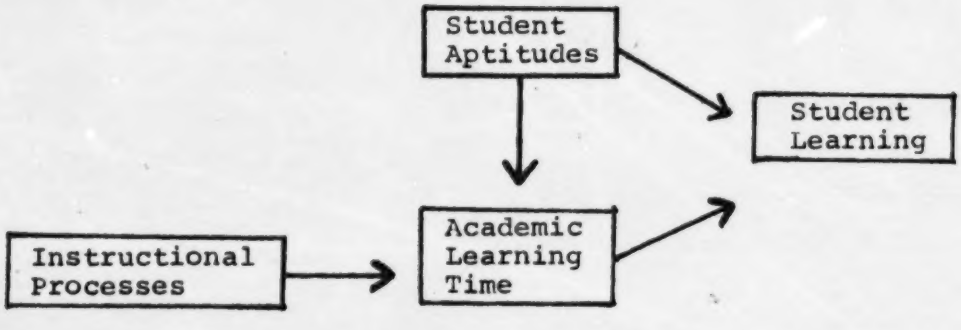
	Student ID#	E	M	H	Total Engaged (EW+EO+EC+ED)	Total Non-Engaged (NI+NW+NO)	Total Read & Math Time (Engaged & Non-Engaged)	Percent Engaged (Engaged Total Time)
First Observation	1101	20.5	156.5	0	127	50	177	.7175
	1102	40.5	136.5	0	152	25	177	.8587
	1103	50	152.5	0	161.5	41	202.5	.7975
	1104	11	187.5	0	150.5	48	198.5	.7581
	1105	55	147.5	0	162.5	40	202.5	.8024
	1106	50	164.5	0	173.5	41	214.5	.8088
Second Observation	1101	58	107	0	70	89	159	.4403
	1102	52	69	0	91	30	121	.7521
	1103	61	100	0	113	23	136	.8309
	1104	100	57	0	105	42	147	.7143
	1105	100	38	0	106	32	138	.7681
	1106	52	99	0	116	43	159	.7296

INSTRUCTIONAL MODEL

A Theory of Instruction: ALT and Teacher Functions

Interventions will be based upon a theory of instruction proposing that: Academic achievement is a function of student aptitude and student academic learning time. Student aptitude refers to the entering characteristics of the student that are outside the realm of control of the instructional process. Therefore, if we determine that instructional processes that result in increased student academic learning time (ALT), we will have determined variables that result in increased student learning.

ALT is time spent by a learner engaged in a task within an intermediate range of difficulty and related directly to an academic outcome. Thus, the three basic components of ALT are student engagement, intermediate task difficulty, and task relevance to an academic outcome. The teacher behaviors that influence ALT can be conceptualized in terms of five functions: diagnosis, prescription, presentation, monitoring, and feedback. In addition, classroom characteristics such as social environment influence ALT. The basic relationships between instructional processes, ALT, student aptitudes, and student learning are diagrammed below.



Academic Learning Time (ALT). As described above, ALT involves engagement, intermediate task difficulty, and task relevance to an academic outcome. Engagement simply refers to the involvement of the student in the learning activity under consideration. Obviously, no student learning can occur if there is no engagement. Therefore, the distinction between student engaged time and teacher allocation of time is critical. Allocated time is a function of teacher behavior, the assignment of a given activity to a specified period of student time. This is important because allocated time generally sets the limits for student engaged time in that particular activity. Nevertheless, there may be vast differences between allocated time and student engaged time. These differences may occur generally for an entire class or differentially across students within a class. Because student engagement in a learning activity is a necessary precondition for learning, ALT must include only engaged time.

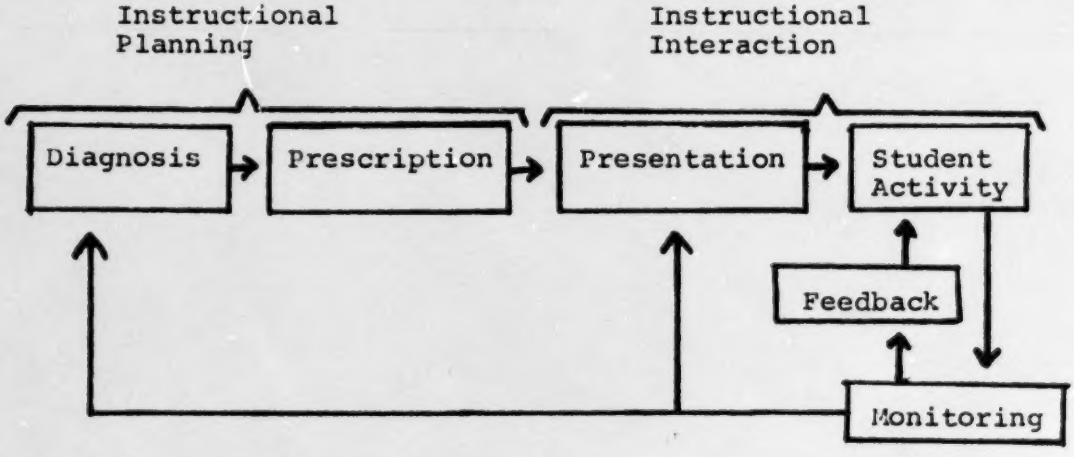
Intermediate task difficulty must be determined in relationship to the individual student. A given task will range from excessively easy to impossibly difficult, depending upon the student for whom the task's difficulty is being determined. Intermediate task difficulty is defined in terms of a broad intermediate range for the purposes of ALT. That is, intermediate difficulty, for ALT, means that the student has at least minimal comprehension of the task with, and only with, some effort. Less than minimal comprehension precludes learning because the student is not ready to even begin learning the task. Comprehension with no effort precludes learning because the student has already mastered the task completely, so that no further learning can occur.

Task relevance to an academic outcome simply identifies the content category to which ALT is directed. A particular study might focus on a narrow range of content outcome categories, and therefore a narrow range of ALT. Clearly, if one attempts to relate ALT to gain on an achievement test battery, then ALT must be limited to those content categories that are relevant to that battery. The present study is limited to ALT involving tasks that are relevant to reading and mathematics outcomes. We are not measuring the effects of ALT for other academic outcomes. Conceptually, however, ALT could be applied to any academic outcome.

The discussion to this point has examined ALT. However, the negative form of the concept, ALT, is also important. A great deal of student time in class consists of Non ALT because the student is not engaged in any academic task or because the academic task in which the student is engaged is of an excessively high or low difficulty. The power of the concept, Non-ALT, is the specification of its cause, either lack of engagement or an unreasonable level of task difficulty. Hence, it is possible to analyze why learning does not occur, in terms of student variables. This is important for the intervention.

Instructional Processes. ALT represents a proximal measure of student learning. If we can determine the instructional processes that result in increased student ALT, we will have also determined variables that result in increased student learning. Therefore, ALT is central to the instructional process, and serves as the basis of the present analysis of teaching behaviors.

The classes of teaching behavior that influence ALT can be conceptualized in terms of five interrelated functions (diagnosis, prescription, presentation, monitoring, and feedback) that occur through time in a roughly cyclical fashion, as diagrammed below.



Depending upon the class organization and curriculum characteristics, the functions in the basic cycle may be satisfied by apparently very different behaviors. Monitoring in a large group discussion is very different from monitoring during seat work. In the first case monitoring may or may not be performed by the teacher at any given time. Similarly, individual teachers may vary in the behaviors by which they fulfill these functions. Observation and analysis must accommodate the full range of behaviors within functional categories.

The cycle of functions begins with a planning phase. The teacher as an organizer and decision maker needs to evaluate the current knowledge, skill levels, strengths, and weaknesses, of his/her students (diagnosis). She/he can then decide on appropriate instructional goals and methods for reaching those goals (prescription). These decisions set the stage for the instructional interaction.

The interaction phase begins with the presentation of concepts or learning tasks to the student. The student responds to this input in some way, with an overt action, with a covert assimilation of information, or by ignoring the input. The teacher needs to monitor the student's responses in order to know whether the instructional goal is being achieved. Monitoring tells the teacher about the student's state of knowledge or skill following an instructional presentation. Guided by information from monitoring, the teacher may provide feedback to the student, provide additional explanation or cycle back to the beginning for further diagnosis and planning (either for remediation of deficits or for moving on to new goals and tasks).

The focus on the teacher as a conscious or intuitive decision maker occurs throughout this cycle. The teacher decides on goals, presents instruction toward those goals, and evaluates whether or not the goals are being reached. She/he decides whether a student's response is adequate or inadequate, and decides, on the basis of the student's response, what to do next.

ALT provides the vehicle for observing this instructional process. Each of the functions in the model contributes directly to establishing or maintaining ALT. Accurate diagnosis and prescription enable the teacher to assign tasks of an appropriate difficulty level for the student, in a content area that is relevant to the student's needs. Presentation that is well structured, clear, and relevant to student needs results in greater student understanding of the task. This, in turn, produces higher engagement and a more reasonable difficulty level. Monitoring and feedback maintain student

engagement and understanding of the task, and allow the teacher to rediagnose and represcribe when appropriate. An examination of ongoing instruction in terms of student ALT and related teaching functions allows one to identify when and where the student learning process is deficient, relating these deficiencies to instructional functions. Interventions can then be conceptualized and implemented to remedy identified problems.

EXAMPLES OF POSSIBLE INTERVENTIONS

Class #1

Class #1 is in a suburban neighborhood. ECE funding is available and an aide is provided. A staggered reading schedule is used, where some students come to school early and leave early, while others arrive and leave late. Reading instruction is conducted during these early and later periods during which the teacher can work with a smaller group of students. The instructional program is based on a series of six learning stations, involving reading, mathematics, and other activities. Intermittent summative assessment is conducted in conjunction with the stations. Other activities are included in reading and mathematics instruction in addition to the stations. Reading instruction includes a series of contracts used with a basal reader and individualized reading program based on a published set of curriculum materials. Mathematics instruction includes group instruction led by the teacher or the aide.

The major concern of an intervention in this class is the reduction of the excessive amounts of time during which students wait for help from the teacher or the aide. This occurs primarily while students are working at stations. The activities at each station are changed on a daily basis. In addition, there are several levels of activities at each station, varying in difficulty and assigned to students according to individual needs. This results in a highly complex instructional program that requires a great deal of structuring and directions. Students frequently ask questions regarding the task assigned to them and the procedures for completing it. Sometimes students even have trouble locating the necessary materials for a particular task.

The intervention will focus on the reorganization of these stations so that the students need less assistance from teachers in terms of the presentation of structuring and directions, monitoring, and feedback. The stations will be restructured so that well-defined and progressive sequences of activities are used. For example, a mathematics manipulatives section might be followed by a section using manipulatives with symbols. Other organizational changes might also be introduced for such purposes as increasing the ease with which students can identify and obtain the necessary materials for each activity.

These intervention changes would reduce the frequency with which students working at stations need help from the teacher or aide. Wait time would thereby be reduced, with the consequence of increasing student ALT. This would also free the teacher and aide to deal with more important student problems. They might present more explanations directed toward serious problems that students may be having understanding skills and concepts. In addition, the teacher and aide would have time to carry out summative assessment more regularly than they can at present. The progressive sequence built into the stations would also facilitate summative assessment in that student performance at one step would readily indicate which other steps the student still needs to cover. The facilitation of summative assessment should greatly improve the teacher's ability to diagnose student progress and needs.

Class #2

Class #2 is in a suburban school with ECE funding. The class has a staggered reading program, with half the students at school for reading from 8:45 to 9:40 and half from 2:05 to 3:00. During

the period from 9:40 until lunch, whole class instruction is carried out. Half the time is spent on phonics and spelling, half is spent on math. It is this reliance on whole class instruction that creates a number of problems.

In both phonics and math it is apparent that the whole class lesson can be too easy for many students and too hard for others. It is virtually impossible to pace the lesson appropriately for all students or to tailor the presentation to the needs of students who are having difficulty. Children who work quickly often finish part of the assignment early. These children then have to wait for further instruction. To keep students continually occupied the teacher hands out filler worksheets to work on while waiting. These worksheets tend to be easy for the students and generally irrelevant to immediate instructional objectives.

Intervention in this class will begin with diagnosis and prescription. The teacher realizes that not all students are receiving appropriate instruction. She wants to help in instituting small group instruction. She has specifically mentioned difficulty in knowing which students to group together. Information from ECE testing is available for diagnosis. Discussion with the teacher may result in the need for further diagnostic testing.

On the basis of diagnostic information, students will be assigned to groups for appropriate instruction. It is probable that one group (or more) will receive less phonics instruction, more creative writing, and more reading practice. At least one group will continue to receive phonics drill, but at a more appropriate level. In mathematics, appropriate grouping will also be developed.

Grouping for instruction is particularly feasible in this class, because of the presence of an ECE aide. The teacher has not previously had an aide, and this is part of the reason she has tended to rely on whole class instruction. The aide now spends most of her time grading workbooks or running errands. Very little of the aide's time is now spent working with the children on academic tasks. The teacher knows the aide is an underutilized resource and wants help in using the aide effectively during small group instruction.

It is expected that the use of appropriate small grouping practices will reduce the excess time in tasks of an easy difficulty level. More student learning time would occur at a medium difficulty level, with a consequent increase in ALT.

The introduction of appropriate grouping practices should also increase student ALT by increasing student engagement during reading and mathematics. This class is now often characterized by disinterest on the part of the students, with resulting disruptiveness and discipline problems. Changing tasks to be more appropriate to each child's level and interest, with more individual adult attention, should increase engagement feedback. One target student in particular is often singled out by the teacher but without a clear statement of contingencies. This student, along with other "behavior problems", is seated in the first row. Changing the seating to follow the new groupings should separate these students while getting them involved with the appropriate tasks.

Class #3

Class #3 is in a suburban school. A staggered reading program is used, with students scheduled to arrive early or leave late depending upon whether they are in the faster or slower reading

groups. This allows the teacher to work with fewer students at one time during reading. The teacher uses five reading groups, supposedly determined according to level of reading achievement. A phonics-oriented reading text is used for teacher-led small group instruction in reading. The teacher follows this text quite closely, showing essentially no deviation from its content and its sequencing of lessons. The mathematics program in this class consists primarily of independent seatwork where each student is given a packet of pages taken from a published text. Students work at their own pace on these packets while the teacher monitors and provides feedback with explanations as necessary.

Intervention in this classroom will focus on the reduction of time spent by students waiting for the teacher's help during reading and mathematics instruction. In addition, there will be efforts to increase the difficulty level of tasks assigned to students working independently while the teacher leads small-group instruction in reading.

The basic problem in the reading program of this class is the provision of adequate instructional assistance to students who are working independently while the teacher leads small-group instruction. With the more challenging tasks, students frequently require additional feedback and explanation from the teacher. This results in substantial periods of inactivity while these students wait for the teacher to finish a small-group sequence. Similarly, students in the small group must wait while the teacher answers questions of the students doing independent work. The teacher has attempted to solve this problem by assigning independent work for which the students will require little or no assistance. However, preliminary examinations

of observation data indicate that this has resulted in an excessive amount of student time devoted to tasks of a very low difficulty level.

Intervention procedures will introduce the use of activity centers for independent work in reading. These centers can be developed so that the materials themselves provide the students with substantial structuring, directions, explanations, and feedback. This should greatly reduce the amount of assistance that students require of the teacher while doing independent work in reading. This, in turn, would reduce the time spent waiting by both students working independently and students in teacher-led small group instruction. As a result, ALT would be increased. An additional intervention to be used for reading instruction is the rearrangement of the seating so that the teacher does not have her back to the class while working with a small group in reading. This would enhance the teacher's ability to provide effective task engagement feedback to students working independently. Student engagement (and ALT) should thereby be increased.

The major problem of the mathematics program in this class is that the students spend excessive amount of time waiting for the teacher's help when they have trouble with their seatwork packets. Although students work at their own pace, many students are working on the same pages on any given day. Therefore, the intervention will reorganize the mathematics program so that structuring, directions, and explanation can be provided to small groups of students who are working, generally, on the same pages. A flexible seating system will be introduced, clustering students according to their current progress through the mathematics text, allowing for frequent

changes in seating patterns according to individual variations in pacing. This would eliminate the inefficient repetition of structuring, directions, and explanations currently provided to individual students. That, in turn, would reduce the time spent by students waiting for help from the teacher. In addition, these procedures would allow the teacher to spend more time monitoring student work and providing feedback, because less time will be required to provide the necessary structuring, directions, and presentation of explanations. The reduction of student wait-time and the enhancement of monitoring and feedback should result in higher levels of student ALT.

Class #4

Class #4 actually consists of two classes located in adjacent "pods" of an open-spaced school building. The school serves a low socioeconomic status population in a poor neighborhood. The two teachers in charge of these classes have worked together closely as a team for several years. Students are divided into high and low groups for both reading and mathematics. One teacher takes the high group while the other takes the low group. Each group operates relatively independent under the direction of one of the two teachers in one of the two pods. However, students move back and forth between pods when the content of instruction changes (reading, mathematics, or other), according to the group assignment for the content at a given time. In addition, the two teachers coordinate their planning closely and instruction appears to be quite similar in each of the two pods at any given time. Both teachers use highly individualized instructional systems for both reading and mathematics. The individualization consist of differential pacing among students,

most of whom work out of the same curriculum materials. There is a great amount of seatwork, although some whole class instruction is also used.

The primary concern for intervention will be the reduction of the amount of time spent by students waiting for help from the teacher. ALT is greatly reduced in these two classes by the large proportion of reading and mathematics instruction during which students simply wait for teacher's help. This wait-time is due primarily to the practice of providing monitoring and feedback to one student at a time during reading and mathematics seatwork. The students generally spend from ten to twenty minutes per day waiting in line or at their desk when they need help. There are generally five to ten students in each pod waiting for help at any given time. Every time a student either comes to a problem that she/he can not complete or finishes an assignment (often a single page) and needs to have it corrected, then the student must wait for the teacher's help.

Several organizational changes should be introduced in order to reduce the wait time in these classes. First, small group instruction should be used in conjunction with the individualized seatwork so that students will be better prepared for their seatwork assignments and can carry them out with less help from the teachers. Although students work at different paces, they do use the same curriculum materials for the most part. In would be possible to seat students in clusters according to how far they have proceeded in a given set of curriculum materials. The flexibility of the physical equipment used in these classrooms would facilitate the use of different seating arrangements for different instructional

periods. This procedure would allow the teachers to present explanations, monitor, and provide feedback to small groups of students without changing the individualized pacing that is basic to their instructional program. Wait time would thereby be greatly reduced, with a consequent increase in ALT.

A second procedure for reducing student wait-time in these classes would be the simplication of record-keeping procedures so that less time would be needed for clerical activities. Currently, a great deal of clerical work is required to maintain records on the individual progress of each student in the classes. The two teachers and the two aides spent time during reading and mathematics instruction trying to complete some of these clerical tasks. The simplication of record-keeping procedures would allow the teachers and aides to spend more time monitoring and providing feedback during reading and mathematics.

A third procedure for reducing wait-time is to simply make greater use of the two aides that work in these classes. The aides rarely monitor student seatwork or provide feedback and are often unoccupied. With some guidance from the teachers, these aides could provide students with additional help during seatwork.

SUMMARY COMMENTS

After reading this outline of an intervention study, and following a discussion between the staff of the Far West Laboratory and a subgroup of the Research Advisory Board of the Commission, the following recommendations were made and accepted:

1) As the Laboratory works from week to week in the intervention classes we should specify the interactions to be undertaken in each succeeding week and monitor our own progress.

2) Laboratory staff should specify the intervention cycle that will be used. In this case, the intervention cycle that we will be using will be to a) identify a problem either through the observation of classroom events or from a discussion with the teacher; b) plan with the teacher an intervention strategy; c) model and/or practice the behaviors to be studied; d) provide feedback on how well the changes seem to be progressing against the standards held for the behavior; e) modify the behavior as needed; f) develop methods for maintenance of the behavior, including provisions for cycling back through all steps again.

3) The Laboratory should take the "whole class" as its goal during the intervention study. Target students should not be the sole object of an intervention study. It is important to treat the whole class and not just target students.

The above three recommendations were noted and will be reflected in the technical report to be submitted at the conclusion of the intervention activities.